

IN THE CLAIMS:

Please cancel Claims 1-37, without prejudice to or disclaimer of the subject matter recited therein. Please add new Claims 46-73, as follows.

1-37. (Canceled)

38. (Original) An image-forming apparatus comprising an apparatus for determining the type of sheet, and an image-forming section for forming an image under conditions corresponding to the identified sheet material, wherein

the apparatus for determining the type of sheet comprises

an impact applying unit for applying an impact against a sheet material,

a detection unit for outputting a signal in response to the impact,

a pulse-generating means for generating a pulse in response to a signal outputted from the detection unit at or above a prescribed threshold level, and

a threshold-setting means for setting the threshold in correspondence with intensity of the signal.

39. (Original) The image-forming apparatus according to claim 38, wherein the threshold-setting means computes the threshold on start or reset of the image-forming apparatus.

40. (Original) The image-forming apparatus according to claim 38, wherein the threshold-setting means computes the threshold when a change of the sheet material is expected.

41. (Original) A method for determining the type of sheet, comprising the steps of:
applying an impact to a sheet from the outside thereof; outputting a signal from a detection unit
by the applying step; and

determining the type of sheet based on the signal.

42. (Original) The method according to claim 41, wherein said applying step is
carried out at the time when said sheet is in the static state.

43. (Original) A method of identifying a type of a sheet material comprising the
steps:

applying an impact force to the sheet material;

detecting attenuation of the applied impact force by the sheet material;

outputting a signal in correspondence with the detected force;

generating a pulse when the signal is at or above a prescribed threshold;

setting the prescribed threshold; and

identifying the type of the sheet material based on the output of the pulse generated
according to the threshold set above,

wherein the threshold is set according to the output state of the signal.

44. (Original) An information output apparatus used in an image forming apparatus, comprising:
an impact applying unit applying an impact to a target from the outside thereof; and
a detection unit outputting information by the impact.

45. (Original) The information output apparatus according to claim 44, wherein said target is a liquid container, and said impact is an external force other than vibration.

46. (New) A signal output apparatus comprising:
an impact applying unit for applying an impact to a sheet;
an impact receiving unit for receiving the impact through the sheet; and
a signal output unit for outputting a signal according to a mechanical property of the sheet, the signal output unit being provided on at least one of the impact applying unit side and the impact receiving unit side,
wherein the impact applied to the sheet by the impact applying unit causes the bending of the sheet, whereby the sheet and the impact receiving unit are made to come into contact with each other, to output the signal from the signal output unit.

47. (New) The signal output apparatus according to claim 46, wherein the sheet is bended at a recess provided to the impact receiving unit side, by the impact applied to the sheet by the impact applying unit.

48. (New) The signal output apparatus according to claim 46, wherein the sheet and the impact receiving unit are made to come into contact with each other at a portion of the impact receiving unit which is opposite to the impact applying unit.

49. (New) A signal output apparatus comprising:
an impact applying unit for applying an impact to a sheet;
a substrate for supporting the sheet;
an impact receiving unit for receiving the impact through the sheet; and
a signal output unit for outputting a signal according to a mechanical property of the sheet, the signal output unit being provided on at least one of the impact applying unit side and the impact receiving unit side,
wherein the impact receiving unit is provided in a recess of the substrate, and, the level of the surface of the impact receiving unit is lower than the level of the surface of the substrate.

50. (New) The signal output apparatus according to claim 49, wherein the level of the surface of the impact receiving unit is designed so as to make the impact receiving unit and the sheet not come in contact with each other at a position opposite to the impact applying unit before an impact is applied to the sheet and come into contact with each other when the impact is applied to the sheet.

51. (New) The signal output apparatus according to claim 46, wherein the impact applying unit applies a plurality of the impacts to the sheet.

52. (New) The signal output apparatus according to claim 46, wherein the impact applying unit applies plural kinds of the impact to the sheet.

53. (New) The signal output apparatus according to claim 46, wherein the signal output unit is comprised of a piezoelectric element.

54. (New) The signal output apparatus according to claim 46, wherein the signal output unit is provided on an elastic deformable member.

55. (New) The signal output apparatus according to claim 46, wherein the impact is applied at the time when the sheet is moving.

56. (New) The signal output apparatus according to claim 46, wherein the impact is applied at the time when the sheet is in the static state.

57. (New) A method for determining a sheet type, comprising the step of comparing an output signal from a signal output unit of a signal output apparatus according to claim 46, with sheet information previously stored to determine the type of a sheet to which an impact was applied.

58. (New) The method for determining the type of sheet according to claim 57, wherein the type of a sheet to be determined is the kind of material of the sheet.

59. (New) A method for determining a sheet type, comprising the step of using (i) a signal outputted from a signal output unit of a signal output apparatus according to claim 46, when an impact is applied to a sheet in the situation that the sheet exists between an impact applying unit and an impact receiving unit in the signal output apparatus, and (ii) a signal outputted from the signal output unit when an impact is applied in the situation that a sheet does not exist between the impact applying unit and the impact receiving unit, to determine the kind of material of the sheet.

60. (New) The method for determining the sheet type according to claim 58, wherein the kind of material of the sheet is determined using a peak value of the output signal from the signal output unit.

61. (New) The method for determining the sheet type according to claim 58, wherein the kind of material of the sheet is determined using a number of peaks of the output signal from the signal output unit or an interval of time between the peaks.

62. (New) The method for determining the sheet type according to claim 58, wherein the kind of material of the sheet is determined using the n -th peak value and the $(n + \bullet\bullet)$ -th peak value, where $\bullet\bullet$ represents a natural number, of the output signal from the signal output unit.

63. (New) The method for determining the sheet type according to claim 58, wherein the kind of material of the sheet is determined using a recoil period of the impact applying unit.

64. (New) An image forming apparatus comprising a signal output apparatus according to claim 46, and a memory unit in which information on sheets is stored, and performing a function of determining the kind of material of the sheet using an output signal from a signal output unit of the signal output apparatus and information in the memory unit.

65. (New) An image forming apparatus, which comprises a signal output apparatus according to claim 46, a conveying means which conveys a sheet and an image forming means for forming an image on the sheet.

66. (New) The image forming apparatus according to claim 65, wherein the conveying means is controlled by using an output signal from the signal output unit and a memory unit in which information on sheets is stored.

67. (New) The image forming apparatus according to claim 65, wherein the image forming means is controlled by using an output signal from a signal output unit of the signal output apparatus and a memory unit in which information on sheets is stored.

68. (New) The image forming apparatus according to claim 67, further comprising fixing means for fixing on the sheet a toner image formed by the image forming means, wherein the fixing means is controlled by using an output signal from the signal output unit.

69. (New) The image forming apparatus according to claim 68, wherein the controlling of the fixing means includes controlling the amount of ink to be discharged toward the sheet.

70. (New) The image forming apparatus according to claim 65, which comprises a plurality of the signal output units.

71. (New) A sheet conveying apparatus comprising a signal output apparatus according to claim 46, and conveying means for conveying a sheet, wherein a conveying condition in the conveying means is determined by using a signal from a signal output unit in the signal output apparatus.

72. (New) A signal output method comprising the steps of:
making a sheet exist between an impact applying unit and an impact receiving unit,
applying an impact to the sheet to cause the bending of the sheet, whereby the sheet and the impact receiving unit are made to come in contact with each other at a position opposite to the impact applying unit, to output a signal according to a mechanical property of the sheet.

73. (New) A signal output method comprising the step of applying an impact to a sheet with an impact applying unit to bend the sheet toward a recess provided at a position opposite to the impact applying unit, whereby the sheet and an impact receiving unit are made to come into contact with each other at the position, to output a signal according to a mechanical property of the sheet.